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SHORT REPORT

Common Iliac Aneurysms with Short or Absent Proximal Necks: Endoluminal Repair with a Covered Endoprosthesis

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Introduction

Covered endoprostheses are advocated as a front line treatment of iliac aneurysms in patients at high surgical risk or who refuse surgery.[1,4,5,10,11] Although it is relatively easy to place such stent grafts when the proximal and distal neck are consistent, it is conventionally contraindicated to use them when the necks are too short or absent. Here we describe two cases of endovascular treatment of common iliac aneurysms with short proximal neck by the fitting of a unilateral aorto-iliac stent-graft.

Case Report 1

This woman, aged 74 years, complained of right intermittent claudication. Her background included hypertension, myocardial infarct and obesity (height: 1.60 m, weight: 103 kg). A right femoral murmur was heard; peripheral pulses were perceptible on the left side, but none on the right side. CT and an arteriogram were performed (Figs 1 and 2), showing an aneurysm of the right common iliac artery located less than 1 cm from its origin, and involving the whole segment and the origin of the external iliac and hypogastric arteries. The maximal diameter was 4 cm and there was a marked peripheral intravascular thrombosis. A Wallstent had been implanted previously at the level of the right external iliac artery in another institution and a tight stenosis was noted at the entry of this stent (Fig. 2). The left iliac artery was patent but calcified. Irregular plaques without stenosis were observed in the terminal aorta. Surgery was at above average risk because of obesity and poor quality of abdominal wall. A classical covered stent endoprosthesis could not be used since the diameter was large (13 mm) and there was not any proximal neck. A tapered 80 mm length stent-graft with 20 mm proximal and 10 mm distal diameters, with a proximal bare-stent, was manufactured (World Medical, Sunrise, Florida, U.S.A.). With the patient having given informed consent, under general anaesthesia, after surgical access of the right common femoral artery, a stiff guide-wire (Amplatz, Medi-tech, Boston Scientific Corporation, Wtertown, U.S.A.) was placed. At first, we dilated

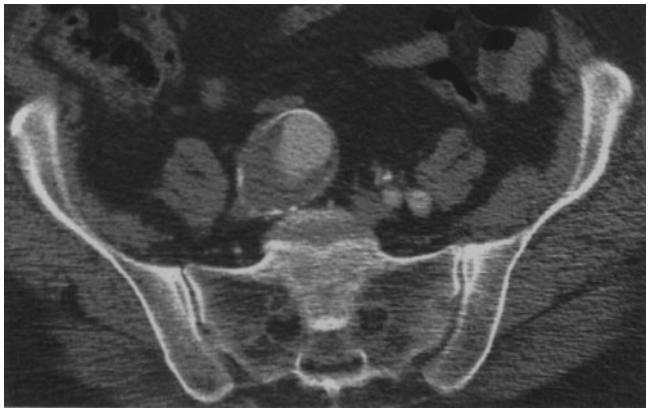

Fig. 1. (Observation 1): Pelvic CT slice showing the right common iliac artery aneurysm, with endoluminal parietal thrombosis.

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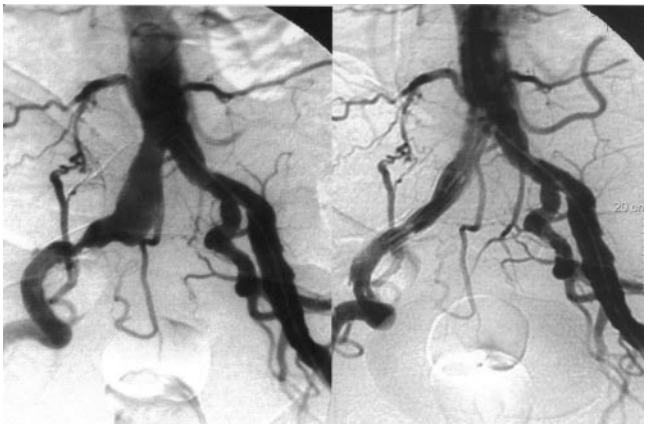

Fig. 2. (Observation 1): Arteriography before and after PTA of the external iliac artery stenosis and stent implantation.

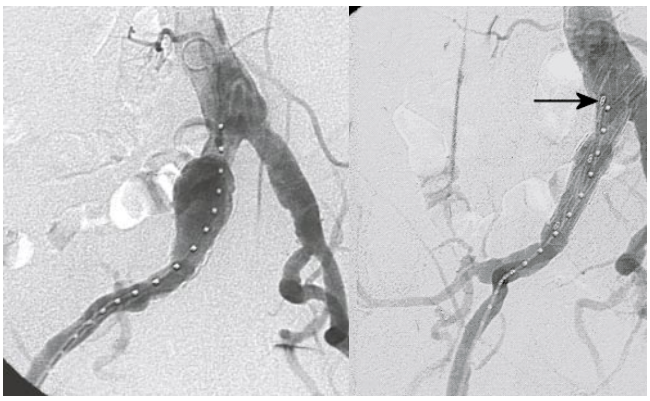

Fig. 3. (Observation 2): Arteriography before and after stenting of the right common iliac artery aneurysm. (The covered segment begins downstream the radioopaque index (near the external side of the origin of stented primitive iliac artery) (arrow).

the stenosed Wallstent. The covered endoprosthesis was pushed through the Wallstent, so the non-covered proximal segment of the stent-graft was placed crossing through the aortic bifurcation so reaching the orifice of the left common iliac. Upon release, the endoprosthesis was dilated (OPTA 5, 10×40 mm, Cordis, Johnson and Johnson, the Netherlands). The aneurysm was excluded, and a normal lumen with parallel edges was restored, at the price of the exclusion of the right internal iliac artery (Fig. 3). During the procedure 5000 IU of heparin was administered and this was continued for three days (2×10^5 IU per day). Anti-platelet treatment (aspirin, 250 mg per day) was begun two days before and continued for six months after the procedure. At two months, a CT scan showed a patent covered endoprosthesis with the proximal non-covered segment positioned opposite the aortic bifurcation without interrupting the left iliac artery flow. Two years later, the patient was asymptomatic, the echo-doppler was normal a further CT scan (obtained because of altered bowel habit) showed patent right stented and left common (and external) iliac arteries.

Case Report 2

This man, aged 75 years, presented with a right common iliac artery aneurysm (28 mm by 7 cm). His background included coronary disease with PTCA, bilateral internal carotid stenoses and PTA of the left superficial femoral and popliteal arteries 2 years before. The risk factors were smoking (stopped in 1970 after five years), dyslipidemia and hypertension. The length of the proximal neck was 10 mm and its diameter 14 mm. The diameter of the distal neck was 10 mm (Fig. 3). A tapered stent graft 20 mm proximal and 10 mm distal diameters, with a proximal bare stent, was made. Its length was 80 mm, and the bare-stent length 15 mm. Afterhaving obtained written patient informed consent, we used a similar technique to that described above (Fig. 4). The clinical and CT results showed that at one year the aneurysm was completely excluded, and the two common iliac arteries patent. The systolic brachial-ankle index was 1.06. The same antiplatelet protocol was applied.

Discussion

Iliac aneurysms with a normal aortic diameter upstream are rare, accounting for 2–7% of all intra-abdominal aneurysms.[1] A population-based study estimates their prevalence at 0.03% based on autopsy findings.[2,15] The common iliac artery is most frequently involved (70–80%), followed by the internal iliac artery (10–30%), with the external iliac usually being spared, for reasons not understood.[3,4,16,14] There is a clear male predominance (male:female ratio of 5–16:1), with most patients being 65–75 years old in surgical series, and 50% are bilateral. Atherosclerosis is the main aetiological factor in isolated iliac artery aneurysms. The complications are as follows: embolism, mural thrombosis, compression of adjacent structures and, above all, risk of rupture (for an aneurysm measuring 3–4 cm in diameter, the risk is 5–9% during the five years following diagnosis).[4,5,11,12] Rupture mortality rate is high: 25–57%.[14–16] The classical treatment is conventional surgery, with rather high morbidity and mortality rates (from 7 to 11% when the surgery is elective, from 40 to 50% in emergency).[2,4,5,14]

The treatment of iliac artery aneurysms by covered endoprosthesis has proved to be highly effective.[1–6,10,11] When the origin of hypogastric artery is

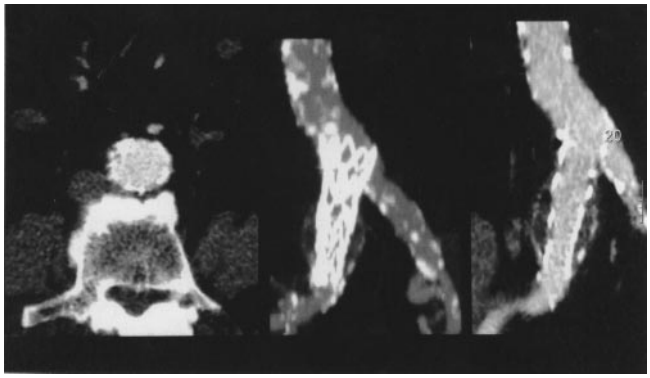

Fig. 4. (Observation 2) : CT slice and oblique reconstructions of the aortic bifurcation after the endovascular treatment.

involved, a preparative coiling occlusion is mandatory to avoid retrograde flow from this artery which may cause a leakage (in our first case, hypogastric artery was previously occluded; in the second case its origin was downstream the inferior neck). However, for a correct implantation of the endoprosthesis and a complete exclusion of the aneurysm, proximal and distal necks with a healthy arterial zone are mandatory. Usually, an endovascular treatment cannot be carried out when the proximal neck is less than 10 mm from the aortic bifurcation. Although the use of aorto-biiliac stent-grafts can also be considered, the procedure is costlier and more difficult. Endovascular procedures avoid the need for extensive intra-abdominal or retroperitoneal dissection. The originality of our two cases is the use of a decreasing diameter graft endoprosthesis (20–10 mm) with a proximal non-covered extremity placed in the aortic bifurcation. The immediate and later CT scans showed complete exclusion of the primitive iliac artery aneurysm with normal patency of the aortic bifurcation and iliac arteries. The diameter of the aneurysm sac was reduced by 20% in one year. The primary and secondary patencies rates of the percutaneous endovascular treatment of iliac aneurysms with sufficient proximal neck (longer than 15 mm), are 92 and 96%.[18] The long-term patency of the new type of stenting we described is unknown. This technique requires an accurate deployment, in order to positione the polyester covered segment at the origin of the iliac aneurysmal artery, and a prosthesis perfectly adapted to the lesion to be treated. The price of such prosthesis is comparable to a six-day hospitalization amount (approximately 4.500 euros).

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